

ASSIGNMENT 2

Textbook Assignment: "Boiler Maintenance," chapter 2, pages 2-1 through 2-30.

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| <p>2-1. On a steam boiler, the head mechanism of the low water cutoff devices should be removed from the bowl for cleaning at least once a</p> <ol style="list-style-type: none">1. week2. month3. quarter4. year | <p>2-4. The steam and water connections of a feedwater regulator should be blown down separately at which of the following intervals?</p> <ol style="list-style-type: none">1. Weekly2. Monthly3. Quarterly4. Yearly |
| <p>2-2. When replacing a broken glass gauge on a boiler, you should take what action first?</p> <ol style="list-style-type: none">1. Close the upper and lower gauge glass valves2. Remove the packing nuts and packing3. Remove all pieces of the broken glass4. Preheat the replacement glass | <p>2-5. Which of the following types of valves is NOT serviced and maintained by a Utilitiesman?</p> <ol style="list-style-type: none">1. Gate type of stop valve2. Globe type of stop valve3. Stop-and-check valve4. Double-acting valve |
| <p>2-3. What action should you take when replacing the gauge glass while the boiler is in service?</p> <ol style="list-style-type: none">1. Heat the gauge glass to the operating temperature of the boiler before installation2. Close the blowdown valve and gauge valves to prevent any loss of steam from the boiler3. Crack the gauge valves slightly and slowly bring the glass to operating temperature4. Close the blowdown valve and open the gauge valves quickly to bring the glass to operating temperature | <p>2-6. In the care of valves, you should loosen and lift the packing at least</p> <ol style="list-style-type: none">1. quarterly2. monthly3. weekly4. daily <p>2-7. At what interval should you open the blowdown valves?</p> <ol style="list-style-type: none">1. Daily2. Weekly3. Biweekly4. Monthly |

- 2-8. At what interval should you test safety valves by raising steam pressure to popping pressure?
1. Semiannually
 2. Annually
 3. Monthly
 4. Quarterly
- 2-9. Lime deposits from a steam injector can be removed by placing the injector into a
1. tube of sulfuric acid for a minute
 2. tube with a mixture of baking soda and water overnight
 3. tube of hot, soapy water overnight
 4. tube of muriatic acid for several hours
- 2-10. At what interval should steam traps be dismantled and cleaned?
1. Monthly
 2. Quarterly
 3. Semiannually
 4. Annually
- 2-11. At what interval should you check the forced-draft fan to prevent dust from accumulating in or around the fan?
1. Monthly
 2. Every 2 weeks
 3. Weekly
 4. Daily
- 2-12. A new gasket should be installed in a handhole fitting
1. each time the boiler is overhauled
 2. each time the handhole is opened
 3. when deposits on the seating surface cause leaks
 4. once a month
- 2-13. Before installing a new gasket, you should water-soak the gasket for what period of time?
1. 24 hours
 2. 12 hours
 3. 6 hours
 4. 4 hours
- 2-14. When correctly centered, the clearance between the shoulder of the manhole plate and the manhole must not exceed
1. one-sixteenth of an inch
 2. one-eighth of an inch
 3. three-sixteenth of an inch
 4. one-quarter of an inch
- 2-15. What action should you take when the clearance between the manhole plate and the manhole exceeds the recommended clearance?
1. Use a different size gasket
 2. Replace the manhole plate
 3. Build up the manhole plate by welding at the inner edge of the shoulder
 4. Grind the manhole until the recommended clearance is achieved
- 2-16. The tension on a manhole gasket is relieved by using
1. a wrench provided by the gasket manufacturer
 2. water pressure from a fire hose
 3. air pressure from a hose
 4. a hammer

2-17. What precaution should you take before making a hydrostatic test of a boiler?

1. Close the air cocks
2. Close the water gauges
3. Gag the safety valves
4. Close the pressure valves

2-18. You have filled a boiler with water until the water discharges from the air cock. You then close the air cock and turn on the building water service valve. What minimum water temperature must you maintain?

1. 50°F
2. 60°F
3. 70°F
4. 80°F

2-19. You are hydrostatically testing a boiler with a maximum allowable working pressure of 80 psi. What amount of pressure should you apply at each of the ten increments?

1. 12 psi
2. 16 psi
3. 80 psi
4. 120 psi

2-20. What is the most pressure you should apply above the maximum working pressure on a low-pressure boiler?

1. 5 pounds
2. 2 pounds
3. 10 pounds
4. 15 pounds

2-21. What is the maximum allowable pressure drop during a hydrostatic test of a boiler over a 4-hour period?

1. 0.5%
2. 1.0%
3. 1.5%
4. 2.0%

2-22. Which of the following methods should you use to test the safety valves after completing a hydrostatic test on a boiler?

1. Air pressure
2. Steam pressure
3. Water pressure
4. Manual pressure

2-23. Of the following properties, which one is NOT a property of a metal?

1. Porous
2. Malleability
3. Hardness
4. Conductivity

2-24. Which of the following chemical compounds is an example of a metal?

1. Hydrogen sulfide
2. Any alloy of steel
3. Sodium chloride
4. Carbon tetrachloride

2-25. Of the following dimensions, which one is NOT a boiler tube identification marking?

1. Outside diameter
2. Inside diameter
3. Wall thickness
4. Length

- 2-26. When a safety-ripping chisel is not available, you should take what action to prepare the tube for removal?
1. Using a round nose chisel, split the tube through and beyond the sheet
 2. Using a diamond nose chisel, split the end of the tube to the tube sheet
 3. Using a square nose chisel, split the end tube and drive out the stub
 4. Using a flat chisel, make two splits about three-fourths of an inch apart from the end of the tube to the header
- 2-27. Before installing a new boiler tube, how should you prepare the outside surface of the tube end that will be expanded in the tube sheet?
1. Polish the tube end with abrasive paper and then round off the tube ends with a file
 2. Remove mill scale with a file and file marks with an emery cloth
 3. Polish the tube end with abrasive paper and wipe with a kerosene-soaked rag
 4. Square off the tube ends with a tuning cutter and polish the tube with a mild abrasive
- 2-28. Tubes that are 2 inches OD or larger should project into the drum or header what distance?
1. Between $\frac{3}{32}$ to $\frac{3}{16}$ inch
 2. Between $\frac{5}{16}$ to $\frac{7}{16}$ inch
 3. Between $\frac{3}{8}$ to $\frac{7}{16}$ inch
 4. Between $\frac{7}{16}$ to $\frac{15}{32}$ inch
- 2-29. "Boilerman's feet" are used to expand tubes that measure
1. smaller than 1 inch
 2. from 1 to 2 inches
 3. from 2 to 3 inches
 4. from 3 to 4 inches
- 2-30. In expanding tubes, you should select expanders for the tube size and
1. thickness of the tubes
 2. type of tube sheet
 3. thickness of the seat
 4. the expansion factor
- 2-31. When belling tubes that are 2 inches OD or larger, you should ensure they are belled a minimum of $\frac{1}{8}$ inch and a maximum of
1. $\frac{1}{2}$ inch
 2. $\frac{5}{16}$ inch
 3. $\frac{1}{4}$ inch
 4. $\frac{3}{16}$ inch
- 2-32. When boiler tubes are leaking, you should use which of the following methods to accomplish an emergency repair?
1. Re-expand the tube
 2. Remove the tube ends and weld the tube sheet closed
 3. Weld the end closed
 4. Plug the tube ends

2-33. When plugging sidewall tubes, you should never plug more than what total number of tubes next to each other?

1. 5
2. 2
3. 3
4. 4

2-34. What material should you use to plug up a case opening?

1. Asbestos packing
2. Plastic refractory
3. Firebrick mortar
4. Navy-approved sealing compound

2-35. When an economizer element develops a leak, you should insert a plug at what location?

1. At the superheater tube bank and the superheater screen
2. At the sidewall heater and the steam drum
3. At the tube sheet and the rear wall tubes
4. At the inlet header and the outlet header

2-36. You are replacing refractory brick in a furnace. To prevent air bubbles from forming, you should place the mortar on the wet brick in what manner?

1. By using an edgewise motion to dip one end and a side of the brick into the mortar
2. By using a trowel to place the mortar on the wet brick surface
3. By placing the mortar in the space to be occupied by the brick before the brick is set in
4. By dipping both ends and a side of the brick into the mortar

2-37. What is the maximum thickness allowed for joints between firebricks in a boiler?

1. 1/8 inch
2. 5/16 inch
3. 1/16 inch
4. 3/16 inch

2-38. The joints between firebricks are beaded with mortar for which of the following reasons?

1. To prevent turbulence in the burner flame
2. To compensate for shrinkage of the mortar as it dries
3. To protect the comers of the firebrick
4. To bond the mortar to the adjacent brickwork

2-39. What material should you use to make emergency repairs to the cracks in the furnace lining?

1. Plastic firebrick
2. Plastic chrome ore
3. Grade A firebrick
4. Fire clay

2-40. You are repairing a refractory brick wall and have rammed a piece of plastic into place so it fits tightly. What action do you take next?

1. Trowel the surface
2. Apply anchor bolts to hold the plastic in place
3. Vent the plastic section with 3/16-inch holes, 2 inches apart
4. Build a small fire to bake out the plastic

- 2-41. What temperature is required to bake out plastic refractory?
1. 1000°F to 1200°F
 2. 1500°F to 1700°F
 3. 2000°F to 2200°F
 4. 2900°F to 3000°F
- 2-42. You should NOT use high-temperature bonding and an air-dry type of mortar, diluted with water to the consistency of light cream, for patching when bricks fall out.
1. True
 2. False
- 2-43. After removing all the old refractory and foreign material, you should inspect the furnace metal for which of the following conditions?
1. Soundness
 2. Tightness
 3. Corrugation
 4. Heat cracks
- 2-44. Before installing tiles, you should take what action?
1. Preheat the tiles
 2. Wash the tiles
 3. Dry fit and match mark the tiles
 4. Coat the sealing area with an insulating pulp cement
- 2-45. It is normal for refractories exposed to hot gases to develop thin, hairline cracks. What size does a crack have to be before you clean and fill it with high-temperature bonding mortar?
1. Between 1/16 to 1/8 inch
 2. Between 1/8 to 1/4 inch
 3. Between 1/4 to 3/8 inch
 4. Between 3/8 to 1/2 inch
- 2-46. After inspecting the door head gasket, you should coat the gasket with which of the following types of mixtures?
1. Gasket cement mix
 2. Vee block mixture
 3. Wash coat mixture
 4. Oil and graphite mixture
- 2-47. When replacing the door gasket, you should use what size rope gasket?
1. 1 1/4 inches
 2. 1 1/2 inches
 3. 1 3/4 inches
 4. 2 1/4 inches
- 2-48. There are seven major phases in the operation of a boiler.
1. True
 2. False
- 2-49. Which of the following actions is NOT required by an oncoming watch stander?
1. Test the water columns and gauges
 2. Inspect the fans, damper, and damper drives
 3. Test fire the furnace
 4. Visually inspect the setting and casting

2-50. Immediately after accepting the operational responsibility for a boiler, you should make a complete inspection of all auxiliary equipment.

1. True
2. False

2-51. Which of the following tasks should you complete before lining up a boiler?

1. Remove excess water from the gas tank
2. Check for fuel leaks
3. Measure the amount of fuel oil with a stick or gauge
4. Check the fuel oil pressure

2-52. Which of the following tasks is NOT performed when lining up a gas-fired unit?

1. Open the main gas cock
2. Check the draft devices
3. Purge air out of the gas lines by external vents
4. Close the control valves and safety shutouts

2-53. Before a boiler is lighted off, which of the following valves must be opened?

1. Feedwater drain
2. Feedwater stop and check
3. Burner fuel
4. Main steam stop

2-54. You are filling a newly repaired boiler with treated water and the temperature of the pressure parts is 40°F. What is the maximum allowable temperature for the fill water?

1. 50°F
2. 60°F
3. 75°F
4. 90°F

2-55. You have just fired off a newly repaired boiler. The temperature should be raised what number of degrees per hour until operating pressure is reached?

1. 50°F
2. 100°F
3. 150°F
4. 200°F

2-56. Before cutting in the boiler, you should open all drain lines between the boiler and the header.

1. True
2. False

2-57. What are the major duties of a boiler operator during normal boiler operation?

1. To ensure the water level is not too high or too low
2. To maintain a safe and efficient combustion condition in the furnace and to correct fuel-air ratios
3. To keep the correct water level and prevent the loss of ignition
4. To see and interpret prevailing operating conditions and take action to control, modify, or correct them

2-58. When securing a boiler, you should relieve the boiler pressure at the

1. safety valves
2. superheater drain and nonreturn valves
3. bottom blowdown valves
4. main steam stop bypass valves

2-59. Before water can be drained, the water must be below what temperature?

1. 250°F
2. 225°F
3. 212°F
4. 200°F

2-60. Of the following situations, which one is NOT an emergency during boiler operations?

1. Broken gauge glass on the water column
2. Flarebacks caused by an explosion in the combustion chamber
3. Tube failure making it impossible to maintain water level
4. Flue-gas temperature above 150 degrees higher than the temperature of the steam produced

2-61. At what time intervals should entries be made in the boiler room operating log?

1. Hourly
2. Every 8 hours
3. Every 12 hours
4. Every 24 hours

2-62. While on boiler watch, you notice that the last-pass draft reading has increased with each log entry. This is an indication of the

1. amount of air being supplied is incorrect
2. gas passages becoming clogged
3. baffles leaking
4. draft fan not operating at the correct speed

2-63. Abnormally high flue gas temperature can be caused by dirty heating surfaces or by leaking baffles.

1. True
2. False

2-64. You should record the outside temperature in the boiler room operating log for a comparison with

1. steam generated and fuel used
2. water pressure and makeup water
3. fuel used and makeup water
4. steam generated and water pressure

2-65. The economy in a steam flowmeter is obtained by

1. dividing fuel burned by steam generated
2. dividing cost of steam by cost of fuel
3. dividing steam generated by fuel burned
4. dividing cost of fuel by steam generated

2-66. At what time intervals should you check the boiler settings for external air leaks?

1. Every 8 hours
2. Every 12 hours
3. Every 18 hours
4. Every 24 hours

2-67. Before entering a boiler to make repairs, you should attach a sign that reads

1. DANGER
2. KEEP OUT
3. CAUTION-MAN WORKING INSIDE
4. CLOSED DOOR

2-68. Fuel-oil suction and discharge strainers should be cleaned at what time interval?

1. Every 8 hours
2. Every 12 hours
3. Every 16 hours
4. Every 24 hours

2-69. When checking flame conditions on an operating boiler, you should use what shade of colored lens in your safety goggles?

1. 1.5 to 3.0
2. 3.5 to 9.5
3. 10.0 to 14.5
4. 15.5 to 30.0

2-70. If the water goes out of sight in the bottom of the gauge glass, you should NOT take which of the following actions?

1. Drain the boiler completely and open it for inspection
2. Close the steam stop valve immediately
3. Feed cold water to the boiler with low water until it has cooled
4. Kill the fire the quickest way possible

2-71. Handles on pull chains to boiler water-gauge cocks and water gate valves for the top gauge cock should be painted what color at shore installations?

1. Green
2. Blue
3. Yellow
4. White

2-72. A valve must be fitted with a new spring and restamped by the manufacturer for changes that exceeds what percentage?

1. 20%
2. 15%
3. 10%
4. 5%

2-73. A lockout device is a mechanism or arrangement that allows the use of a key or combination locks to hold a switch lever or valve handle in either the ON or OFF position.

1. True
2. False

2-74. The use of what lockout device enables more than one person to accomplish hazardous work on a piece of equipment at the same time?

1. Multiple lock adapter
2. Master combination lock
3. Multiple keyed padlock
4. Duplicate key

2-75. Locks should identify the user by

1. name, rank, and serial number
2. color code of rating, name, and serial number
3. name, rate, and shop
4. color code of rating, name, and shop